check for the fee.

A Change of Correspondence Address is also enclosed, together with an Associate Power of Attorney, appointing the undersigned attorney.

IN THE SPECIFICATION

On page 2, second full paragraph, fourth sentence, after "DBA," please insert -- Dynamic Bandwidth Allocation --.

On page 7, please insert the following paragraph into the section bearing the heading "BRIEF DESCRIPTION OF THE DRAWINGS":

A1

> Figures 2 - 4 are tables, in which the rows represent successive time periods, and the columns indicate events occurring in the time periods.

IN THE DRAWINGS

A PROPOSED DRAWING AMENDMENT is herewith submitted, in which proposed additions to Figure 1 are indicated in red ink.

IN THE CLAIMS

Please amend the claims to be in conformity with the following COMPLETE LISTING OF PENDING CLAIMS.

COMPLETE LISTING OF PENDING CLAIMS.

1. (Currently amended) An improved dynamic bandwidth allocation method in a reservation ~~network~~ system comprising one or more users and at least one headend, wherein one or more of said users request respective allocations of bandwidth based on a state parameter of said requesting user, said headend dynamically allocating bandwidth to one or more of said users in response to said respective requests, said headend responding to each of said requesting users with said allocated bandwidth, said response being delayed for a period of time which is a function of a reservation latency δ of said reservation system, said improvement comprising the step of scaling said ~~state based~~ request by a factor of $1/\delta$.

A2

2. and 3. (Cancelled)

4. (New) Apparatus for use with a headend node which allocates time slots on a channel to users, comprising:

a) a user node which

i) utilizes the channel, and

ii) holds a queue of messages;

b) means at the user node for

i) ascertaining a number N of time slots required to handle the queue; and

ii) requesting the headend node to allocate to the user node a fraction of the N time

slots.

5. (New) Apparatus according to claim 4, wherein the fraction equals 1/latency, wherein latency is an average delay time, measured in units of time slots, between (1) a request for an allocation and (ii) a grant of the request.

6. (New) In a network wherein (1) nodes request allocations of time slots on a channel from an allocator, (2) a delay D exists between issuance of a request and resulting allocation, and (3) delays D can induce repetition of an initial request by a node and consequent multiple allocations in response to the initial request, thereby causing allocation of excessive time slots in response to the initial request, a method of operating a node comprising:

a) ascertaining number N of time slots required to clear a queue standing at the node;

b) making a first request for an allocation of fewer than N time slots from the allocator; and

c) making a second request for an allocation of fewer than N time slots from the allocator.

7. (New) Method according to claim 6, wherein the first and second requests ask for the same number of time slots.

8. (New) Method according to claim 6, wherein the first and second requests ask for different numbers of time slots.

9. (New) Method according to claim 6, wherein the delay D is measured in units of time slots and the first request is for N/D time slots.

10. (New) The method of claim 1 wherein said request equals the size S of a queue of a user divided by δ, namely, S/δ.

11. (New) The method of claim 1, wherein each user

a) determines two amounts, namely,

i) a fraction of a queue held by the user and

ii) number of arrivals of messages at the user at the time of request, and

b) requests bandwidth equal to one of the amounts.

A2

12. (New) Method of claim 11, wherein the user determines whether one amount is larger than the other, and requests bandwidth equal to the larger.

13. (New) Method of claim 11, wherein the determination of two amounts is done by a computer operated by the user.

14. (New) Method of claim 12, wherein the determination of whether one amount is larger is done by a computer operated by the user.

DISCUSSION

Response to Objections to Drawings

In response to the Objection to Figure 1, a PROPOSED DRAWING AMENDMENT is herewith submitted, with proposed changes made in red ink.

Response to Objections to Specification

Amendments have been made to the Specification.

Response to Objections to Claims

Claim 1 has been amended. However, it is believed that not all objections are valid. An annotated copy of original claim 1 is attached, with terms under objection identified in red [brackets,] and antecedent support for those terms underlined. Arrows point from the bracketed [terms-under-objection] to the underlined antecedent support.

Claims 2 and 3 have been cancelled, thereby removing the bases for claim objections.

RESPONSE TO CLAIM REJECTIONS

All claims were rejected as obvious.

Summary of Response

Brief Description of Invention

Under the invention, multiple "nodes" (ie, computers) in a network share a common transmission line. Each node has a queue

of messages, which messages must be transmitted onto the transmission line. However, the nodes cannot all use the (single) transmission line simultaneously: data collisions would occur.

Instead, each node requests time slot(s), from a central agency, to transmit the node's messages. Each node uses its allocated time slot(s), to transmit its messages, and no other nodes use the transmission line during those slot(s).

For reasons explained in the Specification, when each node requests its time slots, it requests fewer slots than it needs. But it repeats the requests (of fewer slots than needed). The total slots requested, in the multiple requests, are sufficient to empty the queue.

In a specific embodiment, the smaller number of slots requested equals a specific number, namely,

(1) the size S of a node's queue,

divided by

(2) a delay time δ (delta),

or S/δ.

Return to Summary of Response

POINT 1

The Office Action asserts that it is obvious for a node to

1) divide the queue size, S, by a certain delay which the PTO finds in Applicant's Specification, and

2) request the corresponding fraction of S.

However, that is **impossible**. A primary reason is that the delay which the PTO finds is not known to the node, when the node makes the request. Thus, it is **impossible** for the node to divide S by that delay.

The delay which the PTO finds is the time between (1) the present time and (2) a later time, when the time slots are to be used. For example, if it is 12 noon right now, a slot may be allocated for use by a node at 1 pm. Thus, the delay is one hour.

But this one-hour delay is established by the central authority which allocates the time slots. This one-hour delay is not known to the node requesting the time slots, at the time of the request, because the request is made **prior to the allocation**. This one-hour delay is established **after** the request is made. Thus, it is **impossible** for the requesting node to "scale" its request by the delay which the PTO finds, because that delay **did not exist** when the request was made.

The MPEP (section cited below) requires that the PTO show an expectation of success, when references are combined in an obviousness rejection. That has not been done and, as just explained, that success would be impossible.

POINT 2

Claim 1 is a Jepson claim. It contains (1) admitted prior art and (2) an "improvement."

The "improvement" has not been shown in the prior art. The MPEP (section cited below) requires that all claim elements be

shown in the prior art.

POINT 3

The rationale supporting the rejection contains (1) a premise and (2) a conclusion. The premise is that

> . . . each user's request may be delayed by a . . . latency . . . d . . .
>
> (Office Action, page 5, second full paragraph.)

The Office Action relies on a particular section of Applicant's Specification to show this premise. (Specification, page 4, last two lines.)

However, the Specification does not actually show this premise. The Specification does not state that the "requests" are "delayed."

Instead, the Specification states that a "delay" may be imposed until the slots, which are allocated in response to a request, **are allowed to be used**. That **does not** show that a ". . . user's **request** may be delayed . . ." as in the PTO's premise.

Restated,

> -- The Specification states that a request for slots is made. Slots are allocated in response to the request. But a delay is

imposed until the slots can be used (such as the one-hour delay of Point 1).

-- The PTO's premise is that ". . . user's request may be delayed . . ." But the cited part of the Specification does not show that.

The PTO's premise is not supported by the Specification.

POINT 4

The PTO's conclusion does not follow logically from its premise. (The premise was discussed in Point 3.)

The PTO's conclusion is that it is obvious to divide the "request" (eg, the queue size) by the PTO's delay.

Applicant respectfully submits that this makes no sense. The delay is, for example, the one-hour delay mentioned in Point 1, above. What is accomplished by dividing the "request" (eg, the queue size) by this delay ? To repeat, if the queue size is 100 messages, what is obtained by dividing 100 by one hour (for example) ?

As a minimum, the PTO must show a logical connection between the premise and the conclusion. The PTO must show that something practical is obtained by the dividing step. That has not been done.

POINT 5

As explained in Point 3, the PTO invokes a premise, and cites the Specification in support. But the Specification does not support the premise.

It could be argued that the citation to the Specification is a typographical error. The PTO may wish to still rely on the premise itself (as opposed to the cited passage in the Specification, which is different). If so, at least the following problems arise.

First, the premise is repeated:

> . . . each user's request may be delayed by a
> . . . latency . . . d . . .

One problem is that this premise (which is part of a rationale for combining references) is not found in the prior art, but is contained in Applicant's own Specification. Applicant's Specification cannot be used as a teaching under section 103.

A second problem is that the undersigned attorney can find no discussion in the Specification of "delaying" the "requests," nor of "delaying" the "requests" by the "latency" "d". Thus, the premise lacks support.

A third problem is that, assuming arguendo that the "requests" discussed in the Specification are found in the prior art, the premise states that they "may be delayed." That is, the PTO is

asserting a modification of prior-art elements.

But such delays have not been shown in the prior art. Further, MPEP § 2143.01 applies to the PTO's creation of delays for the "requests":

> FACT THAT REFERENCES **CAN BE** . . . MODIFIED IS NOT SUFFICIENT TO ESTABLISH PRIMA FACIE OBVIOUSNESS
>
> The mere fact that references **can be** combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.
>
> . . .
>
> FACT THAT THE CLAIMED INVENTION IS WITHIN THE CAPABILITIES OF ONE OF ORDINARY SKILL IN THE ART IS NOT SUFFICIENT BY ITSELF TO ESTABLISH PRIMA FACIE OBVIOUSNESS
>
> A statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references.

This MPEP section precludes the PTO from asserting that the "requests" **can be** delayed, without a teaching in support of creating the delays.

POINT 6

The PTO's rationale is factually incorrect.

The PTO asserts that dividing the "request" by the delay d would reduce, or eliminate, "the overall latency." That is the motivation for the PTO's reasoning.

But reducing the requests does not affect latency. Latency is caused by factors such as (1) transmission delays and (2) computation time in responding to requests. Reducing requests does not change those factors.

As a minimum, the PTO must **show HOW** reducing requests attains the stated goal of reducing latency.

POINT 7

Applicant submits that the PTO's rationale is faulty for yet another reason.

First, the PTO asserts that requests may be delayed by a latency d. Then the PTO asserts that the number of time slots in the request should be divided by d.

Applicant asks, "After the division, are the requests still delayed by latency d ?"

-- If so, then what is the justification for the PTO's assertion that "overall latency" has been reduced ?

-- If not, where is the teaching for

eliminating this latency d, since this was the starting element in the PTO's construction of the claim ? And how was the latency eliminated ?

Applicant submits that, as a minimum, the rationale is incomplete, in failing to answer these two questions.

COMMENT

Not all points made in this Summary are elaborated below. Some are considered self-explanatory.

End Summary

RETURN TO RESPONSE TO CLAIM REJECTIONS

Claim 1

Claim 1, a Jepson claim, was rejected on the grounds that

-- the preamble is admitted prior art, and

-- the "improvement" step is obvious.

As a general response, Applicant points out that claim 1 states that (1) a certain bandwidth (or certain number of time slots) is required by a user but (2) the user requests less than this required bandwidth.

Applicant submits that, as a matter of law, such a procedure is counter-intuitive. Why does the user ask for less than he needs ?

Thus, Applicant submits, the PTO must show a teaching why anybody would perform this counter-intuitive operation. But no such teaching has been shown.

Applicant further points out the following.

Point 1

MPEP § 706.02(j) states:

> Contents of a 35 U.S.C. 103 Rejection
>
> . . .
>
> To establish a prima facie case of obviousness, three basic criteria must be met.
>
> First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.
>
> Second, there must be a reasonable expectation of success.
>
> Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.
>
> The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure.

Applicant submits that the Office Action fails to comply with this MPEP section, for at least three reasons.

One reason is that the "improvement" step of claim 1 (as

opposed to the preamble) has not been shown in the prior art. The MPEP section cited immediately above requires such a showing. Also, MPEP § 2143.03 states:

> To establish prima facie obviousness . . . **all the claim limitations** must be taught or suggested by the prior art.

The second reason is that the PTO's rationale is based on Applicant's own Specification. The Office Action, in support of its position, cites Applicant's page 4, last two lines. But Applicant has not admitted this material as prior art. MPEP § 706.02(j), above, prohibits this use of Applicant's Specification.

A third reason, discussed in detail below, is that no expectation of success has been shown, as required by MPEP § 706.02(j).

In fact, as will be explained, it is **impossible** to "scale" the "request" using the "delay" which the PTO finds in Applicant's Specification. One reason is that the "delay" **does not exist** at the time of the "request." (The "delay" is selected by the allocating agency, in response to the "request." That selection occurs **after** the request is made.)

Therefore,

1) the "improvement" step of claim 1 has not been shown in the prior art,

2) the rationale for adding the "improvement"

step has not been shown in the prior art, but is based on Applicant's own disclosure,

3) no expectation of success has been shown, and

4) it is impossible to scale the request as proposed by the PTO.

Point 2

Applicant submits that the rationale used by the Office Action is factually incorrect, and thus no likelihood of success has been shown. To explain this, Applicant will first provide, as background, one type of context in which the invention can be used.

BACKGROUND

A network contains "nodes." Each node contains a computer. Messages arrive, are generated, or both, at the nodes, and are placed into a queue. The messages in the queue await transmission onto the network.

However, for a transmission line, or channel, which is shared by multiple nodes (as in Figure 1 of the Specification), only a single node may use that line/channel at any given time.

Each node must ask for time periods, or slots, in which to transmit the node's messages. A central agency receives the requests, allocates the slots, and keeps track of the allocation,

so that only a single node is granted a slot at any one time.

However, a time delay occurs between (1) a node's request for time slots and (2) the allocation of the time slots. During the time delay, the node may repeat the initial request, because no acknowledgement of the initial request has been received during that delay. Figure 2 of the Specification illustrates such a situation.

Figure 2 refers to the situation at a single node. In the row t=0, the QUEUE SIZE at the node is 12, and 12 slots were requested. However, the time delay (or "latency") is 3. Thus, at best, the 12 slots will be allocated at t=3. The node repeats the request until t=3, thereby requesting 36 time slots total, when only 12 were needed. As the Figure indicates, 12 slots were used, after allocation, but 24 slots were wasted.

Figure 3 illustrates one solution to the wastage. As Figure 3 indicates, the node requests a fraction of the QUEUE SIZE. That fraction is 1/(latency), wherein latency is the delay, measured in units of time slots, or frames. (See Specification, bottom of page 4 - top of page 5.)

Since the latency is 3, 1/3 of the QUEUE SIZE is requested each time, as indicated in the rightmost column in Figure 3. (Fractions are rounded upward: see row t=4.)

With this approach, fewer time slots are wasted.

Therefore, in one form of the invention, a fraction of the

needed slots is requested, and that fractional request is repeated, rather that requesting all slots needed for the queue in a single request, which may be repeated.

RETURN TO REJECTION

The rejection states that scaling the request (eg, multiplying the QUEUE SIZE in Figure 3 by the fraction 1/3 or, more generally, by 1/delay) is obvious because

> . . . this would obviously result in reducing or, in some cases, eliminate **the overall latency** . . .
>
> (Office Action, page 5, three lines immediately above heading "Conclusion.")

Applicant respectfully points out that this rationale appears to be incorrect. Scaling the request does not eliminate the latency.

The latency results from necessary delays within the communication system, such as

> 1) the delay required by a request to travel to the central agency which allocates slots,
>
> 2) computation delay, once the request is received by the agency, and
>
> 3) the delay due to travel from the agency to a requesting node, after the agency allocates

slots.

Scaling the request does not affect this latency, or at least the PTO has not shown how scaling achieves this effect.

Therefore, Applicant submits that the rationale used in making the rejection is incorrect, and cannot support the rejection.

The rationale shows no expectation of success: no showing has been made as to how a reduction in overall latency is attained by following the PTO's suggestion.

Point 3

Applicant respectfully submits that the rationale used by the PTO is a non sequitur. The conclusion does not follow from the premise.

The premise. The Office Action, page 5, paragraph beginning with "AAPA," states that Applicant's Specification, last two lines on page 4, states that each user's request may be delayed by a reservation latency of d.

The conclusion. The Office Action states that, based on the premise, it is obvious for the user to scale the request by 1/d.

However, several problems exist in this rationale.

PROBLEM 1A

One is that the "delay" upon which the Office Action relies (Specification, bottom of page 4) is chosen by the **agency which allocates the time slots**. That is, as the last line of page 4 indicates, the agency may allocate, to a node, a slot for the period t + 10 deltas, that is, 10 deltas from now. Ten deltas is the delay.

Thus, the "delay" is determined by the agency granting the time slots. The "delay" is simply the time interval until the slot allocated to the node becomes available, or usable. Plainly, one cause of the delay is the fact that other nodes made requests first, and were granted preference.

Consequently, the first problem is that the PTO's premise is incorrect, as a technical matter. The premise is that

> . . . each user's request may be delayed by a reservation latency of d (see spec., page 4, last two lines.
>
> (Office Action, page 5, second full paragraph, lines 3, 4.)

But the passage of the Specification cited by the PTO does not state that the "request" is "delayed." Instead, the passage refers to a "delay" until the slots become usable. That is not a delay of the "request."

Thus, the PTO's statement ". . . each user's request may be

delayed by a reservation latency of d . . ." is not correct. The cited passage of the Specification does not state that the "request" is "delayed."

An incorrect statement cannot be used as a premise in an argument.

PROBLEM 1B

PROBLEM 1A may be stated another way. The PTO states one thing, but cites a passage in the Specification, which states a **different thing**. In such a situation, only the latter passage (the cited passage) may be used (unless the PTO provides other support for its premise.)

The cited passage states that

1) a delay arises between now and when the time slots become available, and

2) this delay is selected by the allocating agency.

THEREFORE, the actual premise of the PTO's argument is not the stated premise, but is the cited passage. The cited passage sets forth the two points immediately above.

Again, if the PTO can show support for its stated premise, then maybe that stated premise can be used. But no such support has been given.

PROBLEM 2

Applicant submits that the PTO's conclusion does not, as a matter of logic, follow from the premise. The conclusion is that the user should scale the request by 1/d, that is, 1/delay.

However, as just explained, the "delay" which the PTO is talking about is the delay until the allocated time slots become available, or usable. That delay is chosen by the allocating agency and, in general, will not be a constant, as the Specification, bottom of page 4, indicates.

Thus, the premise does not lead to the conclusion that the request should be scaled by 1/d. The existence of a delay between now and when slots become usable does not, as a matter of logic, indicate that a previous request for the slots should be "scaled" by 1/(that delay).

As a general principle, suppose I make a request for items, such as making a mail order for 10 reams of typing paper to use in my business. Assume (contrary to the present situation) that I know that a delay of 3 days will occur until the typing paper arrives.

Why would I divide the 10 reams by 3, in making my request ?

PROBLEM 3

It is **impossible** for the premise to follow from the conclusion.

The "delay" which the PTO is talking about is, again, the delay until the allocated time slots become available, or usable, by the node requesting the time slots.

But that delay

1) is selected by the allocating agency, and

2) this selection occurs **after** the request is made by the node.

Restated, the sequence is

1) first, a request by node for slots

and then

2) establishment of a delay, after which delay the slots become available.

It is **impossible** for the requesting node to scale the request by this "delay."

-- The "delay" is not known by the node at the time of the request.

-- The "delay" is chosen by the allocating agency **after** the request.

Point 5

The rationale used by the PTO, and discussed in the previous section, has not been shown in the prior art, as required by the MPEP section cited in Point 1.

Point 6

The PTO's rationale does not follow the CAFC's decision of In re Dembiczak, 175 F. 3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999).

In brief, Dembiczak states that

-- **objective evidence** of a teaching for combining references must be provided;

-- the Examiner's speculation does not qualify as objective evidence;

-- numerous sources can provide a teaching to combine references;

-- knowledge of one skilled in the art can act as a source;

-- however, THE RANGE OF SOURCES AVAILABLE DOES NOT DIMINISH THE REQUIREMENT FOR ACTUAL EVIDENCE;

-- broad conclusory statements by the Examiner do not qualify as evidence; and

-- "particular factual findings" as to the teaching are required, and gives reasons why **facts** are necessary.

The Office Action fails to provide "objective evidence of a teaching for combining references."

Further, the "improvement" clause of claim 1 has not been shown in a reference, as required by Dembiczak.

Further still, it appears that the rationale of the Office Action is a "broad conclusory statement," which is **specifically prohibited** by Dembiczak.

Therefore, Applicant submits that the rejection of claim 1 cannot stand.

This applies to dependent claims 10 and 11.

ADDED CLAIMS

Claim 4 recites:

> . . .
>
> b) means at the user node for
>
> i) ascertaining a number N of time slots required to handle the queue; and
>
> ii) requesting the headend node to allocate to the user node a fraction of N time slots.

These claim elements are not found in the applied art.

Claim 6 recites:

> a) ascertaining number N of time slots required to clear a queue standing at the node;
>
> b) making a first request for an allocation of fewer than N time slots from the allocator; and
>
> c) making a second request for an allocation of fewer than N time slots from the allocator.

These claim elements are not found in the applied art.

The preceding applies to the claims depending from claims 4 and 6.

Claim 10 states that the request equals (1) the size of the queue at the time of the request, divided by (2) the latency, delta, measured in frames, or slots.

That has not been shown in the prior art. The Office Action has not shown a queue in the prior art, nor the latency, delta, nor a suggestion to divide the former by the latter.

Claim 11 recites making a determination of two amounts. That has not been shown in the prior art.

Claim 12 states that the larger amount of claim 11 is requested. That has not been shown in the prior art.

Claims 13 and 14 state that the determinations are done by computer. That has not been shown in the prior art. Of course, the "user" in other claims can take the form of a computer.